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The Sight-Saving Review

Volume XVII Number 1

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Table of Contents

PAGE

NEW LIGHT ON LIGHTING, Preston S. Millar 3

RELATION OF SYPHILIS TO BLINDNESS, Martin J. Cook, M.D. 10

SULFA THERAPY IN EYE INFECTIONS, Fred Loe, M.D. 16

THE ORGANIZATION OF A GLAUCOMA CLINIC, Jay G. Linn, M.D. 26

GLAUCOMA CONTROL PROGRAM IN MINNESOTA, Dorothy H. Hamilton 30

GLAUCOMA CONTROL IN NEW YORK, Alva Trotter 34

DISTRICT OF COLUMBIA GLAUCOMA PROGRAM, Phyllis J. Howe 37

A PLAN FOR EARLY DISCOVERY OF GLAUCOMA IN A LOCAL COMMUNITY, Evelyn M. Carpenter 41

RETROLENTAL FIBROPLASIA—AN EYE DEFECT IN PREMATURE INFANTS, Paul M. Runge, M.D. 44

NOTE AND COMMENT:

Confusion in Names and Programs 49
Eye-Bank Reports on its Work 50
A.P.H.A. Meeting 50
College Health Conference Held in New York City 51

PAGE

International Association for Prevention of Blindness... 51
Pauline Williamson Retires from Metropolitan Life Insurance Company 51
Russell Sage Foundation Appoints New Director 52
Vocational Rehabilitation Courses 52
Physicians Urged to Watch Mental Factors in Ocular Disease 52
Pan-American Congress of Ophthalmology 53
I.E.S. Medal Awarded 54
British Ministry of Education Considers Visual Standards for Teachers 54
Fireworks Accidents in North Carolina 55
Industry Assumes Responsibility for Motor Vehicle Fleet Safety 55
Local Sight Conservation Conference Held 56
Government Recommends Improved Seeing Conditions for Microfilm Readers 56
Yale Establishes an Institute of Occupational Medicine.. 57
Back Issues of the REVIEW 57

CURRENT ARTICLES OF INTEREST 58

CONTRIBUTORS TO THIS ISSUE 64

Medical
Japan
610.5
S57

New Light on Lighting*

Preston S. Millar

EMPHASIZES the need for common sense in the application of the principles of good lighting.

IN any public address, it is usually considered to be good form to introduce some sort of allusion to the Bible. So, for this occasion, I have chosen a text. The text occurred to me upon examining the program of the sessions that are now approaching a conclusion. I observed that provision had been made for something like twenty speeches in the daytime and only one at night. Immediately there occurred the Psalmist's declaration, "Day unto day uttereth speech, and night unto night showeth knowledge."

To me today has been assigned the task of uttering speech on the subject of lighting, and it is a day speech. I think that you may infer that there is assigned to you the task of showing wisdom about lighting at night. If I can say anything that will enable you to bring a little more wisdom to bear in regard to lighting as you experience it at night, this effort will not be entirely wasted.

A few years ago, I had the privilege of presenting to the National Society for the Prevention of Blindness a demonstration lecture on light and vision. Today I am proposing to offer some remarks, not to ophthalmologists, not to illuminating engineers, but to people who use light in the ordinary course of living. First, I should like to draw your attention to the train of evils that follow upon inferiority in illumination. On the one extreme, there is actually a hazard to life and limb and eyes. On the other extreme, there is offense against the esthetic sense. In between, over a wide range,

* Excerpt of talk given during the 1946 Conference of the National Society for the Prevention of Blindness, November 25–27, 1946, New York, N. Y.

there are impairment of functions, inefficiency in the performance of tasks, discomfort, perhaps distress to the eyes.

There is no field in which this inferiority displays itself more dramatically and impellingly than in the case of street and highway lighting and, since I am talking to people who are using light in the ordinary course of living, I would suggest that every one of us is much concerned in street and highway lighting. The statistics of the National Safety Council record that in 1941, the last year of somewhat normal traffic, 40,000 people were killed in traffic accidents. Of those, during the daytime when traffic is heaviest and exposure is greatest, 17,000 were killed. But at night when traffic is much lighter, 23,000 were killed.

After considering all the variables between daytime and night, the conclusion seems inescapable that the major factor in the greater accident rate at night is the disability under which drivers labor due to inability to see well. It has been competently estimated that something like 10,000 persons are killed in a year due to the lack of adequate street and highway lighting from fixed light sources. That holocaust continues principally because the money that would be required for adequately lighting streets and highways has to come out of already overburdened state, county, and municipal budgets, whereas the cost of the accidents that result from the inadequacy or the lack of lighting are borne by the victims. If those two could be brought together in the same budget, I believe it would become immediately apparent that the economical thing to do would be to put in the proper lighting of streets and highways for the safety of drivers and pedestrians. If that were done, not only would economy for the community be effected in the long run, but much suffering would be avoided.

In other forms of lighting, there is no such dramatic and compelling conclusion to be drawn as to the evils of lighting inferiority, but it is only a matter of degree. Wherever the lighting is inferior, difficulties ensue which ultimately may affect vision, at least causing discomfort and possibly something worse, if long continued.

The art of illumination may be said to consist in revealing that which it is desired to see and revealing it for comfortable and easy seeing. In lighting, as in every activity in life, we do well if we endeavor to define the objectives. The objectives of lighting for

social intercourse are one thing. For occupations in the home, whether they be reading, sewing, culinary or laundry occupations, the requirements and the objectives to be attained differ, and these in turn differ a great deal from the objectives of lighting in commercial offices and in industry.

My own pet ideal with regard to lighting is that there should be adequate light without the observers being conscious of the source of the light. If you look into many stores and offices, and then go into them, you might be forgiven for thinking that the place is a lighting fixture sales office. The most prominent things in view are the sources of light. The exact converse of that condition is what I have just described as my pet ideal.

I went the other day into a Third Avenue elevated railroad station. There I was interested to find an old-fashioned barrel stove accompanied by the inevitable ash pail. That was the heating device for that station on our antiquated Third Avenue Railroad in New York City. We long since have learned to get the source of our artificial heating out of view. We are here in a room that in the winter is warmed artificially, but the source of that heat is not visible. We are far from attaining to that practice in lighting. In some cases we may not want to attain it but, for the generality of illumination installations, the more nearly we can approach that objective of having adequate lighting while not being conscious of the presence of the light source, the better will our lighting be—the more comfortable for vision.

Recently I was led to conjure with the idea of formulating in simple language the fundamentals of good illumination. It seemed to me that if it could be stated so simply and definitely that anybody could understand it, and if it could be so set forth that no installation of lighting that would be regarded as good would fail to comply with those fundamentals, while no installation that was thought to be poor could comply with them, there would be available a criterion which might have a great deal of usefulness. I must say that I have not had from confreres any great amount of encouragement in the idea, but nevertheless I have persisted. Here are the three proposed "categories of illumination": (1) illumination should provide comfortable visibility for the purposes to be served; (2) sources of light should be pleasantly inconspicuous or, in

decorative lighting, perhaps pleasantly conspicuous; and (3) every prospect should please so far as illumination can accomplish it.

These three points can be used as a criterion for the test of lighting anywhere. Take this room for example. First, illumination should provide for comfortable, easy vision of that which it is desired to see. Here we are able to see the food, see that it is tastefully served, and we are not dependent on taste alone to know what we were eating. We see the faces of fellow diners pleasantly illuminated. In general, I should say that this lighting installation would rate pretty highly for dining purposes, as we are using this room today. It is quite different from the type of restaurant in which there is an attempt to achieve a night-club atmosphere. There, light is purposely employed to distract attention from gastronomic enjoyment to, shall I say, some other forms of enjoyment. And so far as the tables and the food are concerned, there is something like the description of Dante's Inferno—"darkness and gnashing of teeth."

As to the second point, in this room light sources should be pleasantly inconspicuous. Well, I think we have to remember that this room is also used for other purposes than the one to which we are putting it. From where I stand, these light sources are not pleasantly inconspicuous, but I suppose they are intended to be decorative and so we may rate them pleasantly conspicuous. Third, every prospect should please. That is no test for this occasion. This is such a nice audience that a most atrocious kind of lighting would not make it anything but a pleasing prospect to look around this room.

If we could have some simple statement of the fundamentals of lighting and apply it in our home or in places to which we go, we would become aware of lighting problems and of the potentialities of getting better results from lighting. We would contribute very largely to create an atmosphere of interest in lighting that would have the result of improving conditions all around.

Fortunately, light sources are available in great variety and of qualities that are of great value. The incandescent lamps which have served us and are still serving us so well, are the common source of light. We can get some impression of how much they serve, from the statement that something like one billion incan-

descent lamps are made a year, all the way from the tiny grain of wheat lamp with which the surgeon explores the inner man, to the great 10,000-watt lamps used for lighting motion picture scenes and aviation fields. They have the great merit of being simple, producing a steady light and a light which is of a very agreeable color. Man's eyes have been evolved under incandescent light. In the daytime, sunlight is associated with the more strenuous part of life. In the evening, the light of the flame is associated with warmth, comfort and relaxation. The filament lamp produces light that is of the same character as those two sources of light produce and is between them in color. It departs from the flame color toward the sunlight color as its temperature is increased, but it is always along the line of what might be called natural light.

The more recently introduced fluorescent lamps have the great merit of producing two and a half to three times as much light for the electrical energy consumed as does the incandescent lamp. We have to pay for that excellence of efficiency through certain complications that have to be dealt with when using fluorescent lighting. In the first place, the sources are big. They are more difficult to handle and control, but competent manufacturers and engineers have been able to deal with that very well. In the second place, the lamps are arc lamps. They require control apparatus. Two 40-watt fluorescent lamps which are the most commonly used type cost about two dollars, I think, whereas the equipment for controlling them costs about six dollars. Whereas, the lamps weigh perhaps a pound and a half, the equipment for controlling them weighs eleven and a half to twelve pounds. That is quite a serious complication. But it can be and is dealt with.

The next thing about an arc lamp is that on our common electric service—alternating current—the current passes through zero 120 times a second. That causes the light which follows it to rise and fall, producing a little cyclic flicker. It is not enough to be perceived ordinarily by the eye, but if one is viewing some rapidly moving object, then the flicker becomes annoying. Manufacturers very cleverly have gotten around this difficulty by providing that, for most classes of service, lamps are used in pairs so arranged that when the light of one is at a maximum, the light of the other is at a minimum, and vice versa. That reduces the flicker below the point

where it is objectionable for any purpose. More or less this device is in service effectively today.

Another complication that has to be dealt with in the case of fluorescent lamps is that the fluorescent lamp is a mercury arc. The mercury arc produces radiation in lines or bands throughout the spectrum. Some lines of radiation are within the visible spectrum. Others are beyond the visible, in the ultraviolet region. Little of the radiation within the visible spectrum passes through the glass tube of the lamp. It is utilized to activate the fluorescent powders within the lamp which produce a virtually continuous spectrum such as that provided by sunlight or the incandescent lamp, but differing in balance of color, depending on the type of fluorescent powders used. Through those powders, however, there comes a little of the visible radiation from the mercury arc. This is especially strong in the green radiation—it amounts to approximately ten per cent of the total illumination produced by the fluorescent lamp. In some installations, where no attempt has been made to compensate for this mercury line radiation, you may have observed under fluorescent light that people appear to be rather gray. Their complexions suffer, and some other colors are not shown to advantage. This is a difficulty, but it can be dealt with very competently. The advantages of the fluorescent lamp, in added efficiency and production of light with less heat, are of much greater importance than are the complications that I have mentioned. But the complications are there and need to be dealt with.

There is an excellent illustration of the lighting problem in the offices of the National Society. Those offices are lighted by incandescent lamps. The installation is antiquated. The wiring which was installed many years ago is inadequate and does not permit putting more load on the line, as the electrical people say. The Society's activities have grown so that it has become necessary to utilize every square foot of space in the offices. That means that some of the workers have to be tucked into corners where the lighting is especially inadequate. The Board of Directors, very rightly, has made up its mind that something must be done about it. The most trying visual task is the reading of stencils for producing the useful mimeographed material that is being issued from the Society's office. The reading of stencils imposes a severe visual task because

the light is unquestionably inadequate and it is not properly applied. To improve this situation, we have made a stencil reading-aid in which the light is applied to the back of the stencil. This illustrates the point that it may not be so much a matter of how much light is available as it is a matter of how the light is used.

I should like to urge upon this audience that it accept the message of our text. Whether or not you have gotten anything out of this talk, there certainly is an opportunity for you to display wisdom in regard to lighting this night and every night. Lighting fundamentals in themselves are simple, and if you will do what the National Society for the Prevention of Blindness staff is now doing, holler loud enough about poor lighting, and needle those who might be able to help you get it fixed, you can improve lighting in all your surroundings and thereby you can conserve vision.

Relation of Syphilis to Blindness*

Martin J. Cook, M.D.

PRESENTS an outline of syphilis, its infectiousness, and its effect on the eyes.

SYPHILIS is responsible for blindness in about ten per cent of the blind. However, the incidence of syphilis in some institutions for the blind may be higher than ten per cent, for certain inmates may be blind from causes other than syphilis and at the same time be syphilitic. Regardless of the relationship of blindness to syphilis, it must be emphasized that, with exceedingly rare exceptions, syphilitics in sight-saving classes or in schools for the blind are not infectious. For an understanding of this statement, one must have a basic understanding of the course of a syphilitic infection.

Syphilis may be divided into two great groups, acquired and congenital. The acquired infection, in over ninety-five per cent of cases, results from direct contact with a syphilitic in an infectious stage. Syphilis acquired through innocent means other than kissing is very rare. The drinking fountain, the toilet seat, eating utensils, can practically be excluded as potential sources. Luckily, the cause of syphilis, a tiny corkscrew shaped organism, the *Spirochaeta pallida*, is very fragile. It succumbs rapidly to drying, soap and water, or mild antiseptics. Warmth and moisture are essential for its existence; even when these are provided, it lives but briefly outside the human host. Many attempts have been made to grow this organism in the laboratory; despite the greatest care and the use of every imaginable form of enriched media, all attempts have

* From the Department of Research of the New York Eye and Ear Infirmary, aided by the Ophthalmological Foundation, Inc.

failed.* Were it not for this extreme fragility of the *Spirochaeta pallida*, it is probable that the entire human population would be syphilized!

Congenital syphilis is syphilis acquired by the unborn child from its syphilitic mother. It is sometimes improperly termed "hereditary syphilis"—improperly, in that it is not transmitted by the germ plasm but is an infection transferred from the mother to the infant by way of the placenta.

Outline of the Stages and Forms of Syphilis

Acquired syphilis progresses through four stages: primary, secondary, latent, and late manifest (tertiary) syphilis.

Primary Syphilis.—This, the initial stage of the acquired form of syphilis, is characterized by a hard, often painless sore called a chancre. Usually the sore appears on the genitals. It represents the site of entry of the spirochete. The lesion commonly appears two to three weeks after direct contact with an infectious syphilitic, heals spontaneously in a period of days to weeks. Frequently such a lesion is so small and seemingly innocuous that it is overlooked. Or it may never be visible, developing inside the vagina, on the cervix, or inside the urethra. The sore contains living spirochetes and, if an uninfected person comes in contact with such a lesion, he may become infected. The blood test for syphilis is often negative when the chancre first appears, becoming positive in a few days.

Secondary Syphilis.—Rashes of the skin and lesions of the mucous membranes are the outstanding manifestations of this stage. These signs usually appear six to twelve weeks after the infection was acquired, and clear spontaneously in a few days to weeks. Here too, the signs and symptoms may be so minor as to escape notice. A faint rash, a slightly sore throat, a few swollen glands may be the only evidence of the disease. The skin eruption contains active spirochetes. However, unless the surface of the lesions is abraded or macerated by moisture, transfer of the infection by way of the skin does not occur. The whitish patches known as mucous patches which appear on the mucous membranes are

* The Reiter strain, cultured at Johns Hopkins University, is thought by some workers to be a true *Spirochaeta pallida*, but this is not generally accepted.

highly dangerous sources of infection. Transfer of the disease in this stage can readily result from sexual intercourse or kissing. Cases have also been recorded of transmission through the use of a common razor, drinking glass, or towel. For such innocent transmission to occur, only a very short interval can elapse between the use of the article by the syphilitic and the uninfected person. Ordinary hygienic measures render such transmission impossible. The blood test for syphilis is invariably strongly positive in this stage.

Latent Syphilis.—As implied by the term, latent, syphilis in this stage shows neither signs nor symptoms. The only evidence of the disease may be a positive blood test for syphilis. Latent syphilis is somewhat arbitrarily divided into two phases:

1. *Early latent syphilis.*—After the secondary stage has subsided, there is still some possibility of transmission of the disease. This possibility is limited almost entirely to sexual intercourse. With the passage of time, the chance of transmission becomes less and less. Three to five years after the infection has been acquired it is probably impossible to transmit the disease even by the most intimate contact.

2. *Late latent syphilis.*—Syphilitics who have been infected for more than three to five years and have no signs or symptoms of the disease are placed in this category. Perhaps fifty per cent or more of all persons infected with syphilis will achieve this stage of latency and have no further trouble arising from the disease, even though they are not treated. The less fortunate individuals subsequently develop manifest late syphilis.

The blood test for syphilis tends to become less strongly positive with the passage of years and in some cases may even become negative.

Late Manifest (Tertiary) Syphilis.—So far as the infected individual is concerned, syphilis is generally a relatively innocuous disease in its earlier stages. Many years pass before the ravages of syphilis on vital structures of the body become apparent. Cases of late syphilis are not problems so far as spreading the disease is concerned. They are problems requiring individual medical care. Most common of the manifestations of late syphilis are:

1. *Cardiovascular syphilis.*—This is one of the commonest causes of heart disease in the age group of thirty to fifty years.

2. *Cutaneous and osseous late syphilis.*—Large destructive lesions of the skin and bones may develop. Though they may be repulsive in appearance, such lesions are not potential sources of infection. This form of syphilis is becoming rare in this country thanks to improved facilities for early detection and treatment of syphilis.

3. *Neurosyphilis.*—Involvement of the central nervous system by syphilis can produce a great number of clinical pictures. Involvement of the brain may produce a type of insanity known as paresis. Spinal cord involvement causes tabes dorsalis (locomotor ataxia) which is characterized by peculiarities of gait and difficulty in walking which may become incapacitating.

Atrophy of the optic nerve, leading to partial or total loss of vision, is sometimes associated with tabes or paresis, sometimes occurs independently.

Most neurosyphilitics have a positive blood test for syphilis, but in some instances it is negative. The spinal fluid examination usually reveals the presence of syphilis.

Congenital Syphilis.—A pregnant woman who has syphilis and is not treated has four chances out of five of having either a syphilitic stillbirth or a living syphilitic offspring. The baby acquires the infection while still in the uterus during or after the fifth month of pregnancy. If the mother starts antisyphilitic treatment by the fifth month of pregnancy, she can be practically assured of having a nonsyphilitic child.

At birth the congenital syphilitic may have lesions of the skin, particularly on the palms of the hands, soles of the feet, and about the anus and genitalia. These are analagous to the secondary skin eruptions of acquired syphilis. The moist lesions are highly infectious. Often a congenital syphilitic has no signs of syphilis at birth. In later years blindness, deafness, deformities of the bones and teeth may point to the existence of congenital syphilis.

As in acquired syphilis, infectiousness is limited to the early years of the infection. A congenital syphilitic of school age has had his infection for at least six years. Thus, all congenital syphilitics in schools can be likened to cases of late acquired syphilis of an equal number of years. There is practically no infectiousness in such children.

Ocular Syphilis

With the above outline as a background, we can now return to the subject of ocular syphilis. Almost without exception, syphilis found among blind students will be of the congenital type. Ocular manifestations of this form of syphilis will be limited almost exclusively to three categories: (1) interstitial keratitis, (2) syphilitic optic atrophy, and (3) syphilitic chorioretinitis.

Interstitial Keratitis.—This is an inflammatory involvement of the cornea, producing whitish opacities. It rarely occurs before the age of eight, is most likely to develop in the early teens. It is the commonest ocular form of congenital syphilis.

Syphilitic Optic Atrophy.—Atrophy of the optic nerve is less common in congenital than in acquired syphilis. It is often associated with syphilis of the central nervous system which in children runs a most vicious course.

Syphilitic Chorioretinitis.—Inflammatory damage to the retinal and choroidal coats of the eye leads to varying degrees of visual impairment, depending upon the location of the inflammatory lesions.

Treatment of a syphilitic may cure his syphilis, but it cannot remove the scars of his healed syphilitic lesions, cannot restore nerve tissue which has been destroyed. Rarely can one hope for any visual improvement by antisyphilitic treatment in blind school-age children whose visual impairment is due to syphilis. In these children, the damage has been done and cannot be repaired. Their syphilis should be treated for their general well-being rather than with any hope of restoring their vision. For the reader who still retains a trace of syphilophobia, further reassurance may be gained from the fact that a very small amount of treatment, only a few injections of a heavy metal, serves to render even a case of early syphilis noninfectious.

In addition to heavy metal therapy with arsenicals and bismuth, we now have penicillin which shows great promise as an adjunct to the treatment of syphilis. Fever induced by mechanical means such as the Kettering hypertherm or by inoculation with malaria is of great value, particularly in the treatment of early interstitial keratitis and optic atrophy. The method chosen must be adapted to the individual case.

With improved diagnostic facilities, increased public awareness of the nature of syphilis and the recent advances in syphilotherapy, it is not inconceivable that within our time ocular syphilis will become a rarity.

The attitude which should exist toward institutionalized syphilitic children, whether blind or sighted, must now be obvious. There should be no isolation, no distinction made between them and their mates. If treatment is necessary, it should be carried out with a minimum of fuss. The medical records of the syphilitics should be the responsibility solely of the attending physician and nurse. The diagnosis should not be disclosed to any but medical personnel. Unfortunately, this is rarely possible in most institutions. However, teachers and lay workers who have a basic knowledge of the nature of syphilis, on learning the identity of the syphilitics among their charges, will be able to avoid setting them apart by manner or by deed.

Sulfa Therapy in Eye Infections*

Fred Loe, M.D.

THE efficacy of sulfa drugs in treatment of trachoma and other eye infections is described.

Trachoma

Until 1937, when the gradual increase of trachoma on the Indian Reservations reached its peak, we were still using Hippocrates' prescribed treatment of trachoma—scarification of the lids. Through the course of the years, I may add, we had used almost every conceivable means of lid scarification, mechanical and chemical, in our earnest and unceasing effort to alleviate the terrible suffering among our patients.

Extent of Trachoma.—As you know, until we found that sulfanilamide has a distinct curative effect on trachoma, we had been unsuccessful in our efforts. Our Indian patients at that time were estimated to number 24,000; furthermore, that figure did not include the infected poor people of the Cumberland and Ozark hills; nor did it include the trachoma among the thickly populated, low-income groups throughout the world. For instance, it did not include the 75 per cent of the population of India, estimated to be trachomatous; the 98 per cent of Egypt; the 55 per cent of China; the 30 per cent of Japan; the 65 per cent of Siam; the 50 per cent of Malay and Poland; the 30 per cent of Italy and Greece; the 25 per cent of Mexico; or the 30 per cent of Argentina, Brazil and Central America. Whereas the incidence of trachoma was reduced from 26.6 per cent in 1937 to 3.6 per cent in 1941 on our Indian Reservations, practically nothing has been accomplished among the other trachomatous people of the earth. The trachoma

* Presented during the 1946 Conference of the National Society for the Prevention of Blindness, November 25–27, 1946, New York, N. Y.

eradication program of Arkansas under the direction of Dr. Cosgrove and that in southern Illinois, under Dr. Gradle, are notable exceptions.

As each infected person is more than likely to infect several others, because of their poor hygienic living conditions; as a spontaneous cure is rarely if ever found; as one out of every 17 untreated cases of trachoma goes blind; and, as fully 50 per cent of them develop visual defects not improvable by glasses, you can glimpse the tremendous world problem confronting us.

Sometime around the year 1935, by means of private funds, the Indian Service established a research laboratory on the Fort Apache Indian Reservation in Arizona, for the purpose of finding the causative agent of trachoma. That particular location was chosen because a boarding school for trachomatous Indian children was maintained there, and therefore that choice of location insured a constant supply of trachoma-infected material with which to infect the eyes of the baboons used in the research laboratory. The work was done under the direction of Dr. Phillips Thygeson, of Columbia University, and was sponsored by the Indian Service.

As a result of the experimental work done in that laboratory it was proved that trachoma is caused by a filtrable virus. To quote from Dr. Thygeson's report, in 1939, to the Director of Health of the Indian Service:

"**Etiological Studies.**—The studies on etiology have been completed with the conclusion that the agent of trachoma is filtrable, that it has the three principal virus characteristics, namely: filtrability, inclusion body formation and inability to grow on bacteriological media. Trachoma virus differs from the typical large virus variation, having both large and small forms and also in the fact that it stains well with Giemsa, whereas the elementary bodies of the typical virus require mordants or special staining procedures. Trachoma virus and the viruses of inclusion blennorrhea, psittacosis, and lymphogranuloma inguinale appear to form a group of atypical viruses transitional between the typical viruses and the rickettsiae."

Meanwhile, in 1937, we had begun the treatment of trachoma by sulfanilamide therapy. (Allow me to say here that, as we found sulfanilamide to be the drug of choice in trachoma treatment, I

shall not bring the other sulfonamides into this short discussion.) For our first experiment, we selected two patients whose condition had been pronounced trachoma by several clinicians familiar with that disease. One of the two patients had had trachoma for two years; one, for eighteen months. Both patients had had grattage, followed by treatment with silver nitrate, given intermittently throughout the periods of their infection; but without noticeable improvement in either case.

Early Experience with Sulfanilamide.—These first patients were given orally a daily dose of sulfanilamide of ⅓ grain per pound of patient's body weight, administered for ten consecutive days; the dose was then decreased to ¼ grain per pound of patient's weight, administered for 14 additional consecutive days. No other medication was permitted during this period of treatment. Within five days after this treatment was begun we were able to detect decreasing photophobia, lacrimation, and purulent secretions; the redness gradually disappeared, the granules and papules diminished in size, and the blood vessels became increasingly visible. Within a month both patients appeared to be cured.

Following those two miraculous results we ran other series, always carefully selecting as patients only those who had been under continuous trachoma therapy by the old method, for periods varying from one to seven years. Some were dismissed as apparently cured at the end of two weeks; others, found to be greatly improved after eight days' treatment, were treated for an additional two weeks so as to compare the results.

All those early patients were kept under close daily observation, including daily blood counts, for several weeks; the time was lengthened to monthly check-ups; then to several months, then to a year; and continued for several years.

In 1939, Dr. Greene, of Washington, D. C., stated, "The chronic cases with very thick pannus have been arrested—as time goes on, the cornea will show more improvement." Time proved the correctness of his prediction. We were constantly amazed to find that some of the old blind, pannus cases were regaining some measure of sight; that the vision of the old chronic cases seemed to improve even after several years had elapsed.

It was in 1939, after carefully weighing the value of the clinical

results of our new therapy, that it became our belief that the sulfanilamide exerted a sterilizing effect on the trachoma virus and that nature was then enabled to continue its healing processes. That apparently accounted for the gradual improvement of vision and for the "subsequent arrestments," as we then called them.

As a result of the findings in 1939, it was determined to continue and to extend this sulfanilamide therapy throughout the Indian Service. As our Indian hospitals were unable to cope with the whole burden, the Indian Division of Education generously cooperated in the program and allowed us to use their dormitories during school vacations; by that means we were able to go out into the field and "shake the bushes" in our search for patients, and to diagnose and treat many old people whom we would not have reached, otherwise. Because of our combined efforts, we were able, between 1937 and 1941, as I have said, to reduce the incidence of trachoma from 26.6 per cent to 3.6 per cent. I do not know the present incidence but do know that war greatly depleted our personnel and that there still remains some trachoma among our older Indians.

Diagnosis of Trachoma.—In medical school we were taught that trachoma is a disease of the conjunctiva; we now know, however, that it attacks the cornea as well as, and more often than, the conjunctiva. We often see trachomatous infections of the cornea with little if any lid involvement. Since we have found that it is impossible to diagnose trachoma which has no corneal vascularization; and, since it is impossible, by lid inspection alone, to differentiate between folliculosis, inclusion blennorrhea, and trachoma, it is evident that we must employ other means of diagnosis than lid inspection.

Diagnosis is extremely important if we are to evaluate correctly the results of our treatment and if we are eventually to eradicate trachoma; therefore, we cannot be too careful when making a diagnosis. In addition, we must have positive knowledge that the patient has actually received the prescribed treatment if our published results are to be accurate and uniform in meaning. We emphasize these two factors because of their great importance both in eradicating trachoma and in making an accurate survey of the results of treatment.

We must take into consideration, also, the fact that other conditions resembling trachoma and causing red and inflamed eyes *may* be found in districts known as "trachomatous." Furthermore, trachoma is sometimes found in so-called "noninfected areas." It behooves us, then, in making examinations for trachoma, to be eternally vigilant; to take nothing for granted; and to treat each suspect as a trachoma patient until he can be proved trachoma-free.

There is no fixed relation between the changes in the conjunctiva of the lids and of the cornea. Sometimes we see vascular changes in the cornea with but slight if any lid involvement; or, we may find mild trachoma showing slight lid involvement, with little or no corneal involvement. Such cases are difficult to diagnose; but, if they clear up under trachoma therapy, we can make a "therapeutic diagnosis" of trachoma. (Dr. Thygeson, of Columbia, and Dr. Benedict, of Mayo Clinic, both said that, if a patient does not show improvement after having received adequate dosage of sulfanilamide for a sufficient period of time, it would be well to look to the diagnosis for fault.) We know that sulfanilamide does not affect folliculosis, phlyctenular conjunctivitis, and other similar inflammatory eye conditions, but it does cure trachoma.

When examining the eyes with a slit lamp, we sometimes find a fully developed case of trachoma with no history of an acute infection. The onset of the disease is sometimes so insidious that the patient may have been infected for months or years without noticeable subjective symptoms. We are convinced that we should never attempt to make a diagnosis without corneal examination under a slit lamp; for, in "experimental trachoma," we find a beginning branching of the loops at the limbus between the second and third weeks of infection.

Furthermore, if we keep constantly in mind the anatomy and physiology of the eyes, as well as the fact that the visible manifestations of trachoma are merely a natural defense mechanism, we then understand that the corneal changes in trachoma are due to a direct infection within the superficial layers of the cornea. When we have overwhelming infections with so much destruction of the corneal cells that nature is no longer able to replenish them, (that is, before we have complete vascularization of the cornea) we get the condition commonly called "trachomatous ulcer." Such an ulcer is almost

always found at the point *farthest* from the blood supply; that is, in the pupillary area, near the center of the cornea. Allow me to say here that, in trachoma, the vascularization of the cornea always begins at the upper pole, in contrast to that in deficiency diseases such as riboflavin, and in phlyctenular conjunctivitis.

These vascular changes of the upper corneal pole can be seen by means of a small, hand slit lamp which is compact and very convenient, and requires only two ordinary flashlight batteries. If we attempt to diagnose trachoma without illuminated magnification of the cornea we can make only a guess; on the other hand, under illuminated magnification, we can discern any vascular changes of the cornea and *know* the diagnosis.

We rarely see a spontaneous recovery from trachoma; also, we have found from experience that one attack does not immunize a patient against reinfections; therefore, when a diagnosis of trachoma has been made, an immediate examination of the entire group of his close contacts should be made; all cases of trachoma found should be treated simultaneously so as to prevent reinfection of any in the group.

Results of Treatment.*—We have used sulfanilamide in treatment of many old pannus cases, some of them so blind for years that they had had to be led around. In many such cases we have seen the pannus cleared up enough that the patient regained sufficient vision to become self-reliant. Even in those trachoma patients whose eyeballs were ruptured by perforating ulcers and sloughing of the globe we treat the disease as vigorously as though we expected to restore vision; those patients are just as able to disseminate the disease as any others. Let me say here that, in experimental trachoma, we have found it impossible to transmit the disease from a trachomatous eye that had been adequately treated for as much as seven days' time. If we are to eradicate all foci of infection we must treat all cases of trachoma without regard to the question of vision.

The following statistics will give an idea of some of the startling things which can be accomplished in the trachoma field: in South

* In his original paper, the author included a brief section on recommended treatment for trachoma, which is not published here because of limitation of space. Discussion on this subject may be obtained, upon request, from the National Society for the Prevention of Blindness, Inc., 1790 Broadway, New York 19, N. Y.

Dakota, in 1941–1942, the Indians represented 3 per cent of the total population of the state. We found this 3 per cent drawing 56 per cent of the total aid to the blind in the state. Ninety-five per cent of the aid to the blind was necessitated by trachoma. We treated all those trachoma cases receiving Blind Aid. After one year's time, re-examination by the state found them so much improved that 25 per cent of them were unable longer to qualify for Blind Aid.

Sulfanilamide as a Prophylaxis for Newborns

To show the basis for our adoption of sulfanilamide as a prophylaxis for newborns, I will give you our line of reasoning: for three years or so we had been treating successfully the many cases of inclusion blennorrhea, picked up in our clinics, by applying sulfanilamide locally in the same manner as for trachoma.

Likewise, we had successfully treated the gonorrheal ophthalmia which we found in our clinics. During all this time we had been worrying about the inclusion body blennorrhea which developed in something like 50 per cent of our newborn Navajo babies, in spite of the routine prophylaxis with silver nitrate solution. We observed that inclusion blennorrhea was not affected in the least by silver nitrate solution.

Inclusion blennorrhea has often been confused with an irritation following application of silver nitrate; that is, because silver nitrate was known to be irritating, any discharge developing a few days after its instillation often was blamed upon the silver nitrate medication. The presence of inclusion blennorrhea, in such cases, was not recognized.

If we think the problem through we will recall that a gonorrheal ophthalmia usually occurs before the fifth day after infection, while inclusion blennorrhea most often is seen about the seventh day following infection. Since inclusion blennorrhea is caused by an inclusion body virus whose natural habitat is within the cervical canal, it is not surprising that so many of our Navajo infants contracted the disease at birth.

When we turn the eyelids of a patient infected with inclusion blennorrhea, we expose a condition that, superficially, resembles trachoma; it differs in that no vascularization of the cornea can be

discerned. Inclusion blennorrhea is usually a self-limiting disease; rarely does it result in permanent damage to the eye structure. However, such conditions as corneal ulcers can and sometimes do result from it. Inclusion blennorrhea cannot be lightly regarded.

As we have said, inclusion body blennorrhea is *not* affected by silver nitrate solution; on the other hand, sulfanilamide powder *is* a specific for both inclusion blennorrhea and gonorrheal ophthalmia. Moreover, the danger of producing a sensitivity to the drug by one local application is so slight as to be negligible and may be disregarded. In addition, sulfanilamide is a very stable drug, maintaining its strength for an indefinite time without renewal; in contrast, silver nitrate solution is very unstable and a fresh supply must be prepared at frequent intervals.

A further point in favor of the use of sulfanilamide as a prophylaxis in the eyes of newborn babies is the fact that no harm results from its local application, while silver nitrate solution is a dangerous drug and vision has been endangered by the accidental use of it in too strong solution.

As long ago as 1939, in his report already referred to, Dr. Thygeson stated that sulfanilamide did have a beneficial effect upon inclusion body blennorrhea; that the problem remained to find a means of obtaining continuous application of the drug and sufficient penetration.

All of which brings us up to September, 1945. We carefully considered all these points and the fact that we would be able to maintain the closest observation of all our patients. (In case of "the outbreak of fire," we would have "a bucket of sand" in readiness.) We then discussed the matter with the state health authorities, telling them what we contemplated doing and why. They gave their enthusiastic consent and asked for a report of our work.

Therefore, in September, 1945, in our Navajo hospital at Fort Defiance, Arizona, we began the prophylactic treatment of all newborns in the following manner: into both eyes of each newborn baby, *immediately* after birth, we applied the very finely powdered sulfanilamide, in sufficient amount to fill the lower cul-de-sac, as in the local treatment of trachoma. This treatment was not repeated; nor did we use silver nitrate or any other medication as a prophylaxis. We always kept the closest possible watch over the babies.

Results of Sulfanilamide Treatment.—Between September 24, 1945 and April 9, 1946, we had delivered in our obstetrical department 124 live babies, six of them from mothers known to have positive gonorrheal infections not previously treated. Not one of those 124 babies developed the least sign of eye infection.

As I left the Indian Service the last of May, I lost personal contact with this work. Recently, however, a report received from the doctor now in charge of the hospital showed that the number of newborns delivered to that date numbered 266. Of those, the report showed that one baby, delivered at home several hours before admission to the hospital, developed a gonorrheal ophthalmia which yielded to penicillin, the drug said to have been used in that case. Three other cases, the report stated, developed a discharge from the eye, negative for gonorrhea, the causative agent of which was not determined. (I should like to repeat here the statement previously made: "We must have positive knowledge that the patient has actually received the prescribed treatment if we are to publish accurate results, uniform in meaning.") Outside of those four cases, no other of the 266 babies treated with the powdered sulfanilamide, in lieu of silver nitrate solution, developed any infection.

Sulfanilamide in Other Eye Conditions

I should like, briefly, to mention two other successes which we have had with sulfa drugs:

1. Pink eye is usually relieved within 48 hours following local application of finely powdered sulfanilamide.

2. Finely powdered sulfanilamide applied locally is an excellent prophylaxis to be used throughout the 48 hours immediately preceding eye surgery. (Just here, I would like to add a word of warning against any surgery on a trachomatous eye until after adequate treatment with sulfanilamide therapy; otherwise, the eye may be lost entirely.)

Conclusion

In conclusion, I should like to stress the following points:

1. Trachoma (a) is caused by a filtrable virus; (b) is spread by direct contact, as by a common towel; (c) flourishes best in poor

hygienic surroundings; (d) is prevented by plentiful soap and water; (e) does not clear up spontaneously; (f) is cured by adequate dosage of sulfanilamide; (g) should be diagnosed only by illuminated magnification of the cornea; (h) is not transmittable after seven days' adequate therapy; (i) results in blindness of one out of seventeen untreated cases; (j) was reduced under sulfanilamide therapy from 26.6 per cent in 1937, to 3.6 per cent in 1941; and (k) still infects almost one-third of the world's population.

2. Sulfanilamide is an excellent prophylaxis for newborns; it obviated both gonorrheal ophthalmia and inclusion blennorrhea in the 124 cases of the series I was privileged to supervise. It is to be hoped that this work can be continued and extended, under close observation, and the results published.

The Organization of a Glaucoma Clinic*

Jay G. Linn, M.D.

THE author describes the establishment of a special glaucoma clinic in Pittsburgh.

THE organization of a glaucoma clinic is not a difficult procedure. President Garfield once said about colleges that if you would give him Mark Hopkins on one end of a bench and a student on the other, that would be enough of a college for him. I believe we can take that statement and change it to our purposes. If you give us a Mark Schoenberg on one end of a bench and a patient on the other, I think that will be enough of a glaucoma clinic for anybody.

When I say this, I am taking Dr. Schoenberg as an example of the earnest worker who had an intense desire to accomplish a given purpose, a purpose for which he put in probably more time and thought than any other man we have had in this country. And therefore I believe that is a fitting way to consider it; and I do not believe that any glaucoma clinic or any other clinic will be a success without such feeling.

I first heard Dr. Schoenberg speak on glaucoma at one of the medical meetings in which he and Dr. Gradle and Dr. Kronfeld, among others, discussed the institution of glaucoma clinics. It made a profound impression upon me. I came home and spoke to the head of the eye department in our hospital, but the project did not seem feasible at that time.

About two years ago, Mrs. Marcella Goldberg of the Pennsylvania Association for the Blind came to our emeritus professor and suggested that we should have a glaucoma clinic. He, in turn, took the subject up with me, and we started. We got all the information

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we could from the National Society for the Prevention of Blindness, and I also wrote to Dr. Knighton, who I knew had a clinic at the New York Eye and Ear Infirmary, and to Dr. Kronfeld in Chicago. They sent me copies of their various forms and records, and then we came down to the National Society headquarters, and visited the Manhattan Eye, Ear and Throat Hospital, where we observed the running of the Glaucoma Clinic. We learned a lot, and came away having a fairly good understanding of the way the Clinic was run.

We also visited the New York Eye and Ear Infirmary, and observed the glaucoma work there. About two months later, we went out to Chicago and visited the Glaucoma Clinic of the Illinois Eye and Ear Infirmary.

In the meantime we made a study of record forms for keeping track of cases, and patterned one that combined the ideas of four or five different record forms. Thus, our record form is not too different from each of them and yet it has a little bit of all of them.

The location of the glaucoma clinic is important. A clinic, you know, in the strict interpretation of the word, means a teaching institution. I believe that every glaucoma clinic should be a part of a teaching institution, and that all medical teaching institutions should have a glaucoma clinic; and in that way, they will make not only the students, but the rest of the community more glaucoma-conscious. In my opinion, many of the doctors who have graduated and are practicing need quite a bit of instruction in glaucoma, just as the students in the university do.

Our Glaucoma Clinic has three chief departments: the medical, the social service, and the nursing. I am not sure but what we should make a fourth and bring the general clinic in on it, because sometimes it seems as though possibly the directors of the clinic-at-large do not appreciate thoroughly what we are trying to accomplish, and if we had them more on the inside with us, we might at times get a little better cooperation.

The medical personnel includes the chief of the Clinic who sees every patient on every visit. The reason is that the person who starts in with that patient should, if possible, carry through with him. The chief can understand the patient better, can give

a better analysis of the condition, and he will have more consideration for the patient. He has an assistant who is at every meeting of the Clinic, too, and helps in all departments of the Clinic, and functions as chief in the absence of the chief.

As a rule, we have two of our resident physicians working at the Clinic, at each meeting. The residents take charge of tonometry, perimetry, at least of the perimetrist—we have a paid perimetrist there part of the time. Sometimes I think it might be better if the residents took all the fields because they would get better training in this phase of work, which is very important. The resident physicians also examine the anterior chamber.

The chief of the Glaucoma Clinic goes over the patient's eyes, examining them thoroughly with the various means that he has—the lens and loop, the ophthalmoscope and the slit lamp; makes the record; and compares his findings with those of the people who have seen the case previously in the general eye clinic. He then orders the treatment, and gives it over to the nurse. He tells the patients when to return and the nurse sees that the patient gets the appointment card for a return visit, and sees that the patient understands the importance of returning.

The social service worker sees the patient, too, on every visit. On the first visit, she charts the social history of the patient; she makes records of the symptoms of the patient, the time of their origin, and other pertinent facts. She also explains to the patient the seriousness of his condition and the need for continued cooperation and for long-drawn-out treatment. If it is explained in the beginning, I believe it is better appreciated and better carried out.

After the patient has been under medical treatment for a while, if operation seems necessary, we refer him back to the general eye clinic and ask for operation; but the social service worker explains to the patient why the operation is necessary and how important it is that it be done. She, having established a more intimate association with the patient than any of the medical personnel can possibly establish, will put it across better than we can. She keeps a record of attendance. She knows how many times that patient has been there. She knows whether he comes on the dates that are assigned to him. If he does not report when he should report, she

checks up as to why he has not come; and if that happens more than once, she goes after him, and usually brings him back.

The nurse, of course, is the person that has charge of the physical equipment of the clinic. She receives the records, and then the patient; and she transfers him to the various people who work with him. If there is any medication to be given, she either gives it herself or sees that it is given by someone else under her direction.

We have a number of volunteer workers who are very good. They do not have any great medical or social service knowledge, but receive preliminary instruction and learn to help in all departments. They are very regular in their attendance, and have proved helpful in many ways.

A perimetrist is available to take the fields—I am not sure whether this should be a lay perimetrist or a physician. The important part of any glaucoma clinic, as I said in the beginning, is the spirit which governs it. Although we have a pretty large personnel in our Clinic, two people could possibly run a clinic just as well as ours is run—maybe better. But we can see more people and keep better records with the larger number of personnel.

Glaucoma Control Program in Minnesota*

Dorothy H. Hamilton

THE work of the local voluntary agency in arousing public interest in the subject of glaucoma is herewith described.

THE Minnesota Society for the Prevention of Blindness is a non-profit, lay health organization with a state-wide program. Recently it put on its "Seven League Specs" in its glaucoma campaign for two years and covered miles by mailing glaucoma literature to all general practitioners in the whole state of Minnesota, via "Glaucoma Packet," with the cooperation of the Minnesota State Medical Association—and not forgetting the "General Public."

Glaucoma Packet for Doctors

The glaucoma packets contained articles and reprints, giving a general description of the disease, how it produces blindness and general informative material on the early symptoms of chronic glaucoma and value of early recognition and control. Several members of the Minnesota Academy of Ophthalmology prepared this material and it has been our privilege to disseminate it.

A barrage of articles was published as a follow-up to the packet, and distributed to the general practitioners. These included a reprint, "Diagnosis of Glaucoma"; "Differential Diagnosis of Acute Glaucoma"; and "Glaucoma Calendars." A lecture covering the subject was presented at the annual State Medical Convention and Dr. William O'Brien, director of Preventive Medicine at the University of Minnesota gave many radio talks on glaucoma. Several conventions gave us exhibit space which was utilized for

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publicizing the methods of detection, diagnostic technique, results of neglect, and the principles of treatment. Considerable newspaper publicity was also obtained.

Special Pamphlet for Optometrists

Optometrists were circularized with a specially prepared booklet on "Recognition of Glaucoma—A Message to Optometrists." This booklet was sent to every optometrist in Minnesota as well as in surrounding states. The optometrists accepted the distribution of this 8-page pamphlet to their members, which presented an opportunity of familiarizing this group with the means of recognizing glaucoma and the results of its neglect.

The Minnesota Society has also extended its glaucoma campaign to the general public, since all levels of society are subject to visual damage from this disease. Because relatively few persons are aware that glaucoma may be discovered by examination before sight becomes affected and that effective treatment must be instituted before vision is seriously damaged, the Society decided it was a worth-while undertaking to give all possible publicity to this disease. Efforts were concentrated upon an attempt to overcome the lack of adequate information of the medical profession as well as the public, by a definite program of education through all available channels.

Work With the Public Through Community Agencies

Effectiveness in this campaign was also obtained by distribution of pertinent materials to health agencies and professional groups. The Society endeavored to increase its affiliation with other state agencies, both public and private, and to make the glaucoma campaign of interest to the public in order to put over its message of public education. Through window displays, placards, and exhibits with cooperating agencies, we strove to acquaint every man and woman in Minnesota with the spelling of "glaucoma" so that they will cease to confuse it with trachoma. Cooperating agencies in the glaucoma program included: Council of Agencies for the Blind; Minnesota Public Health Association; Minneapolis Society for the Blind; Social Welfare Conference; Minnesota Education Association; Federated Women's Clubs; Public Health Nurses;

Minnesota Hospital Association; Welfare Boards of 87 counties; Minnesota Dental Association; Minnesota State Fair; Congress of Parents and Teachers; Minnesota State Medical Association; State Department of Education; Radio Council; National Society for the Prevention of Blindness.

Exhibits.—We were pleased with the "honorable mention" of our first glaucoma exhibit, at the Minnesota State Medical Convention. This exhibit displayed "Means of Prevention," showing reduced fields of vision: "Hopeful," "Doubtful," "Too late." It also showed the proper and improper methods of testing intraocular tension by tonometry and palpation.

Another glaucoma exhibit included twelve 15″ x 20″ eye fundus water colors prepared from cases in an ophthalmologist's office, at various stages. This exhibit showed the slowly progressive changes in the optic nerve and corresponding vision fields were prepared to show the gradually narrowing down to the "Gun Barrel" stage.

Record Forms for Hospitals

Glaucoma Record Forms were placed in five leading hospitals in Minnesota. One hundred Glaucoma Packets were requested by the National Society for the Prevention of Blindness with the idea that other states might be encouraged to carry on similar programs. These packets were sent out nationally to selected official state agencies and also voluntary state agencies.

Results

Our glaucoma project has been a most valuable contribution to our program for the prevention of blindness. It has made thousands of persons conscious of the value of eye examinations for its detection, and it has provided information on the methods by which it damages sight and what can be done about it when discovered early enough. Every ophthalmologist has knowledge of the value of this campaign from the fact that many patients—even some doctors—are now asking outright whether or not their own eye examination revealed any evidence of glaucoma. We are told that it is a frequent experience now to have patients ask specifically if they have or have not glaucoma, indicating that they have learned something about it.

Certainly the Minnesota public has received a most liberal education on the subject of glaucoma during our campaign. The committee felt that the form of publicity which has perhaps yielded the greatest results at the least expense has been the use of exhibits and window displays and a traveling window display illustrating the subject of glaucoma, in leading towns. The numerous professional articles sent out, the booklet which went to every optometrist in the state and our exhibit at the State Fair were certainly a great means of helping in this campaign. In addition, one Sunday newspaper with a circulation of 500,000 carried an illustrated glaucoma article on three-quarters of the front page of the magazine section, which received considerable attention.

The Minnesota Society feels that the glaucoma campaign can be measured only by its result in lessening blindness due to the disease, in contributing to the happiness of more people—those who have the malady, and their friends and relatives—in ultimately lessening the number of blind individuals who have become so because glaucoma was not recognized for one reason or another. Unfortunately, there will always be a few who cannot be helped by any means.

However, there has been definite progress to report in the Minnesota glaucoma program which shows that its efforts have been productive and of permanent value. While it has been desirable to enlarge the Society's activities into other fields, such as industrial safety, school surveys, and lighting projects, the Minnesota Society will continue along the same lines of glaucoma education, to incorporate the "glaucoma idea" into the general practitioner's routine examinations.

May I take this opportunity to express the appreciation of the Minnesota Society for the Prevention of Blindness to the National Society which made available articles, pamphlets and glaucoma materials for use in our packet.

Glaucoma Control in New York*

Alva Trotter

DESCRIBES the work of a state agency in conducting a glaucoma control program.

IN New York State, we, of the Prevention of Blindness Service, Commission for the Blind, State Department of Social Welfare, feel that the glaucoma program can be best handled as a community organization program. That is, we take a unit, a political unit, the county unit, as our means of reaching everyone with the message of glaucoma. We have two goals: (1) the medical goal, to reach the general practitioner, to review with him the symptoms of glaucoma and the part he plays in the early recognition of this disease; and (2), to reach the general public with educational material. Our ultimate goal is to set up within the community some resource which will remain after all this preliminary work has been done. That resource, in most instances, has been a central registration.

New York State, despite the fact that we have New York City, is rural; and the idea of having glaucoma clinics elsewhere than in New York City, I think, is a little farfetched at this point. Therefore, how should we reach the glaucoma patient in the rural area? The central registration is our answer. We request the ophthalmologist to select the agency in which he wants the clerical part of the job to be done. We suggest a social agency, a health agency, the county medical society, or the academy of medicine. The ophthalmologist sends into the clerical center the name of the patient, the address, other identifying data, along with the date that that patient should return for follow-up.

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The clerical staff is responsible for notifying that patient far enough in advance of the appointment date so that he can return to the ophthalmologist for further examination. If the patient does not return, a second letter is sent, and is followed up with a home visit.

The home visit is made by a worker from the Prevention of Blindness Service, at this point. We have been operating on this system for about three years. In one community, an agency saw this way of assuming responsibility for the follow-up and incorporated a prevention of blindness program along with their other functions.

I think it would be wise for us to review exactly what the value in functions is in a central registration. We explained these functions to the ophthalmologist as follows:

1. To provide exchange of information between ophthalmologists and clinics on previous attendance records.
2. To provide a central source for social-medical follow-up.
3. To furnish information regarding the control of the disease in its various stages.
4. To furnish statistical information regarding the prevalence of the disease.
5. To provide material for education of the public as to the need for adequate eye care.
6. To provide material for professional education.
7. To provide a means for a total evaluation of the glaucoma problem.

I do not know how this would work out in other than a rural community. In New York State it has worked successfully. It has made it possible for our agency to do a good case-finding job. From our point of view, that is good. We know those glaucoma patients come within the category of the blind because we have mandatory reporting of blindness in this state. How many there are who have the beginning symptoms of glaucoma we do not know, but naturally from a preventive viewpoint, our interest lies in locating these patients as early as possible.

We like to set up such controls in a community, using the resources that are within the community as a method of stimulating that community to figure out its own needs and meet its own

problems. We hope that after we have done a fairly broad, statewide job we can present, at a later date, some rather identifying and revealing information about the glaucoma problem in New York State.

I should like also to tell you about how we reach the general practitioner. It would be difficult for us to visit each one. We do visit every ophthalmologist when we can, but we cannot visit every general practitioner. We send each practitioner in the state an original letter with a so-called flash card, containing a simple statement of symptoms. That is followed by a series of six cards, and the seventh and eighth cards are accompanied by a letter. In these letters we explain the total program, and what we hope they will do in it, and what they will get out of it. This is another simple method of reaching a large group of people in a rural community.

We carry on a similar program with our public health nurses, and with the social workers in a community. I think you can realize how difficult any other type of program would be in a rural community where, in the wintertime, the snow is knee-high and, in the spring, the mud is up to the mudguard of your car. Practically all the impedimenta possible prevail in our rural areas. Perhaps other communities which abound in similar situations may see ways in which they could adapt some of our practical suggestions and, in turn, offer suggestions to us to make our program more workable.

District of Columbia Glaucoma Program*

Phyllis J. Howe

DESCRIBES the cooperation of a local agency with an eye, ear, and throat hospital in the establishment of a glaucoma clinic to serve the community.

TO many, the topic, "A Glaucoma Control through Community Projects," may seem a little odd because it probably is, in many communities, simply a part of the whole medical setting. But in a community where there are nine hospitals, only three of which have recognized social service departments, it is easy to see that much depends on the private organizations outside.

The Glaucoma Clinic of the Episcopal Eye, Ear, and Throat Hospital in Washington was developed through the interest and cooperation and hard work of the District of Columbia Society for the Prevention of Blindness. This organization is a private social agency interested in promoting all activities which will prevent blindness and conserve vision, in all fields of health, welfare, education, and industry. This agency, which is composed mostly of lay members, but headed by a medical social worker, drew up a plan of having a medical social case worker in the Glaucoma Clinic of Episcopal Hospital. It was the purpose of this worker to demonstrate the service of medical social case work to all patients with glaucoma. A statement of objectives was prepared and presented to the medical board of the Hospital, to the superintendent, and to certain other individuals who were interested. These suggestions were later discussed in detail with leading ophthalmologists who were to have charge of the Clinic. All of this took a great deal of planning and work before the final plan was accepted.

Everyone interested in glaucoma was concerned that such a

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clinic should be established, and since this Hospital was a specialized eye hospital, it was thought to be the best place for the Clinic.

The money for the salary—and that is always a problem—was contributed by the Variety Club which, many of you may know, is a national organization of actors and artists with different local groups in each community. The Club agreed to sponsor the project for two years; at the end of that time, the project would be evaluated to see what had been accomplished.

In setting up the Glaucoma Clinic, arrangement was made for the medical social worker to be responsible, from the administrative angle, to the Hospital but, because of the function of the existing Social Service Department, she would not be responsible for her case-work supervision. This was to be carried by the Executive Director of the District of Columbia Society for the Prevention of Blindness. We realized that this was not the ideal plan, but under the circumstances it seemed the only way to handle the problem, and it has worked quite satisfactorily.

It was the ultimate goal that the Hospital would establish a Social Service Department, which would have a director who would be able to take over the supervision of the Clinic.

In 1942, the Glaucoma Clinic was established and has been functioning from 1942 to 1944 under the direction of Dr. Inez Wilbur, aided by a nurse and a trained orthoptic technician who did the field of vision and carried the appointments. In 1944 a trained medical social worker was appointed. It was her responsibility to handle the administrative details, but more important, the case-work service to the glaucoma patient, and she was also charged with the responsibility for interpretation of the project to the community.

In the beginning, the Clinic was established to meet one day a week, on Thursday afternoon. Dr. Wilbur was the only doctor, and all patients with glaucoma were referred to this Clinic. In 1945, this was discontinued at the request of the medical board, for two reasons: (1) there were too many patients to be seen by one doctor on Thursday afternoon; and (2) the doctors preferred to follow their own patients and not refer them to a special clinic.

For our own particular setup, this has worked out very satisfactorily, and I do not know whether the other one would have been

better. At the present time, we have 200 patients on our follow-up. I might say that it is very difficult to evaluate statistically because, in 1944, the only statistics that we had of glaucoma patients were those who were coming to the Thursday Glaucoma Clinic, and not all of the doctors were referring their glaucoma patients. We started with a total of 53 patients, 35 of whom were coming regularly. At present, as I say, we have 200. The majority of our patients are colored, and they make about 130 individual visits a month.

We have tried a special system in the Glaucoma Clinic which many glaucoma clinics have tried, that of having a special type of medical record. This type of medical record was worked out in conjuction with the doctors and is a record that can carry both medical and social information. We have what we call a medical social report on the record telling a few facts about the patients. The medical social service department also uses a more intensive record called a folder record for patients who need longer service. Then, of course, we do some writing of notes on the medical record. Every patient, old or new, is referred to the social worker routinely. All new patients are interviewed on first visits, but all old patients are always seen. We are able to do this because our number of patients is so small that we do not see more than 15 in an afternoon.

The medical social worker has the responsibility, as you all know, of the administrative details of the Clinic, talking things over with the nurse, the physician, and other Clinic personnel. But her most important contribution is, we feel, the medical-social case work with these patients. Since glaucoma is a disease which is controlled only by treatment and surgery, and since most of it depends on the patient's returning, it is very important that each patient be known and be followed very closely.

As to what has been accomplished in the two years and what we hope for is a little difficult to estimate. I can only cite from a few examples of what has happened. The interest and the cooperation of the Hospital personnel has been both gratifying and stimulating. They have all been very much interested, have contributed greatly to the program, and never once have I gone to them with any ideas or for any help that they have not responded wholeheartedly. This is quite interesting because when I first came here to work, several

persons outside of the Hospital suggested that it would be much better if I perhaps worked in some other hospital as it was well known that eye surgeons were not particularly interested in the health and welfare of their patients. I can say only for myself—and I am sure you have all found it to be true—that they are just as interested, if not more so, than any other surgeons.

We have found that the community has also been quite interested in our project. We have more eye patients, of course, as a group, than any other hospital, although there are two other hospitals which have eye clinics. We have had referrals from outside agencies, from private doctors, and from individuals. Many of them come from as far as Florida.

The demonstration of medical social work has proved invaluable in the Hospital in that it has resulted in the asking by the doctors for medical social case-work service to be available not only to patients with glaucoma, but to all patients in the hospital. It has also helped to show what a medical social case worker has to offer the eye patient. In a community where specific eye work and medical social work are limited in scope, we have found that everyone has been very much interested in what we had to offer. The project has also helped to integrate and develop certain eye facilities and social agencies dealing with persons with limited vision.

Perhaps one of its most important and far-reaching effects has been that it has awakened a need within the community for medical-social service for all patients and not just patients with glaucoma.

It is very gratifying indeed to see what a private social agency with the right interest and cooperation can do in the community to stimulate glaucoma projects.

A Plan for Early Discovery of Glaucoma in a Local Community*

Evelyn M. Carpenter

PRESENTS a unique project on the early discovery of glaucoma and the necessary follow-up.

SEVERAL years ago the Philadelphia Committee for Prevention of Blindness, Inc., worked out plans for a glaucoma service in four large eye clinics in our city. It was designed to provide a comfortable, serene atmosphere within the clinic, to interpret glaucoma to the patient and to develop a close and abiding relationship between him and his doctor.

Before plans could be set in motion a worker had to be found who had had experience in an eye clinic. One who was gentle and whose kindly feeling for people could be relied upon to inspire them to follow the doctor's recommendations and to return for supervision again, again and again. When finally such a person was located, we got under way.

A study of records yielded 205 diagnosed cases with varying degrees of vision. Two were attending clinic regularly.

Our firm belief that comfortable surroundings, skilled ocular care, careful interpretation, and everlasting follow-up would eventually bring about cooperation of all or nearly all patients seemed to be well founded. Numbers increased steadily until more than 800 faithful patients were registered in eleven clinics. Additional workers had to be employed, but the task of initiating them became easier as standards were established and the pattern of service was clearly defined.

Experience with advanced glaucoma stimulated thinking in

* Presented during the 1946 Conference of the National Society for the Prevention of Blindness, November 25–27, 1946, New York, N. Y.

terms of early case finding, and it established the basis for consideration of mass examinations to find glaucoma earlier—before great damage to vision had occurred in one or both eyes.

Our Medical Advisory Committee believed that we should seek out groups of middle-aged men and women who were not economically secure, none too well nourished, and who for one reason or another might have troublesome problems. Just at that time the theater of war and war industries had called young people into service so that it was not difficult to find among their replacements the groups we sought. The first happened to be a large department store in Philadelphia, and we were fortunate, indeed, in securing full cooperation of the administrative staff.

We were permitted to carry on an educational campaign to acquaint employees with the facts about chronic, simple glaucoma —its insidious approach, the need for early diagnosis, everlasting supervision and the too-frequent end results of irregular or inadequate treatment. This was accomplished in several ways: by talks over the store's loud speaker system, the monthly house organ, bulletins, flyers, and pamphlets. When the series was complete we asked for registrations for free eye examination, and actual work began. Examinations were made by an ophthalmologist who has perhaps seen more cases of glaucoma than any other man in Philadelphia. Basis for my belief lies in the fact that to him were assigned all glaucoma patients in the largest clinic where we began our work in 1940. He has carried on in that capacity since that time. A secretary takes medical dictation. Visual acuities and histories are taken by a third person.

Persons who have an elevation of tension are asked to return for a re-check. If it persists or if there are fundus changes which indicate need for further diagnostic study, the condition is discussed and referral is made to an eye clinic or an ophthalmologist of the patient's choice.

Our case-finding procedure is discovering glaucoma—more than our Medical Advisory Committee had anticipated. So arresting has it been that we have extended the study to two other stores and one insurance company. Although we have examined more than 500—the number we first planned to do—the Committee feels that a study of 1,000 individuals would yield sounder information.

We have come to the conclusion, too, that other types of industry should be considered and, if this is done, the statistical goal will be far greater, possibly 5,000. At this moment, findings among employees in insurance companies are negligible, but again too few have been examined to consider the result significant. What the heavy industries may reveal we, of course, cannot hazard a guess.

Little by little our case-finding project is becoming known. One of our largest newspapers has asked that we come into their plant. Curtis Publishing Company, too, has indicated interest in such a service for their employees.

The public is more or less familiar with mass chest x-ray examinations to locate early tuberculosis. We feel that it is not too visionary to present this case-finding project as a parallel which may well lower the incidence of blindness from glaucoma as spectacularly as tuberculosis has been controlled.

Retrolental Fibroplasia—An Eye Defect in Premature Infants*

Paul M. Runge, M.D.

AUTHOR discusses the relationship between certain ocular malformations and premature birth.

Preface

I should like to preface this paper with a tribute to the late Dr. T. L. Terry for his research and clinical work which has clarified a formerly little understood disease, which he called "retrolental fibroplasia." As Dr. Terry's associate for several years, I had the privilege of working with him on some of the research and clinical problems concerned with this disease. The content of this paper is based on this relationship.

Definition of Retrolental Fibroplasia

Retrolental fibroplasia is a term used to describe an ocular maldevelopment occurring in extremely premature infants. Previous to the coinage of the term "retrolental fibroplasia" this maldevelopment had been called "persistent tunica vasculosa lentis" or "fibrovascular sheath." Both of these terms were somewhat misleading. Many times one or both eyes were removed following an erroneous diagnosis of retinoblastoma. Six years ago a patient with the lesion in both eyes was studied. The history of extreme prematurity led to the discovery of other cases. It soon became apparent that prematurity was the one constant finding in spite of a careful search for other causes, and led to the discovery of other cases.

* Presented during the 1946 Conference of the National Society for the Prevention of Blindness, November 25–27, 1946, New York, N. Y.

Symptoms of the Condition

Further study has made it possible to describe the disease in detail. The ocular lesion consists of:

1. A growth of embryonic connective tissue behind the crystalline lens.
2. The presence of only a few branches of the tunica vasculosa lentis (the vascular envelope which encloses and nourishes the developing lens of the fetus) carrying blood.
3. The presence of the hyaloid artery—seen in those cases where the retrolental mesenchyme (embryonic connective tissue) does not cover the entire back surface of the lens.
4. An abnormally light-colored iris, usually blue, resulting from inadequate resolution of mesoderm (the middle of the germ layers of the embryo) on the front surface of the iris.
5. Retinal folds and even massive retinal separation are found frequently enough, in instances where the fundus can be viewed in part, to be classed as a common primary finding.
6. Possible variation in severity from extensive involvement to minute traces which are commonly seen on the temporal side of the posterior lens surface.
7. Failure of the iris angle to differentiate.
8. Failure of any other part of the body to show abnormalities of a consistent type in association with the ocular abnormality suggests that the lesion is strictly a disturbance of the developing eye. One exception to this may be angiomata which are frequent in the skin. Reese first recorded this. The frequency of angioma in our series is some 17 per cent, but their occurrence in premature infants without retrolental fibroplasia does not appear to have been recorded. The original opinion that mental retardation was an associated and not infrequent finding is open to question. Observation of three children who had been diagnosed as feeble-minded by experts, disclosed that they developed into individuals of unquestionably normal mentality under the guidance of preschool teachers, skilled in working with the blind.

Complications

There are many changes which at the present time are considered to be sequelae or complications of the essential, abnormal ocular development.

1. Lack or retardation of retinal development may be secondary

when the abnormality is bilateral and a searching nystagmus is seen. Even when the lens is only partially covered, poor vision and macular differentiation are indicated by the searching nystagmus which is so frequently observed. The macula does not normally differentiate until some six months after full-term birth.

2. Early shallowing of the anterior chamber appears to be caused mechanically by contraction of the retrolental mesenchyme as it matures. Surgical removal of the lens restores the chamber. Later, the shallowing seems to result from a failure of aqueous humor to form in normal amounts.

3. Lento-corneal synechiae (adhesions) often follow the obliteration of the anterior chamber.

4. Corneal opacities then develop in the region corresponding to the synechia.

5. There is failure of aqueous to form or to accumulate in normal amounts. Thus, the eye fails to grow.

6. Posterior synechiae and bound-down pupils develop.

7. Where some ability to form aqueous humor is retained, in perhaps five per cent of the cases, glaucoma occurs, but usually the eye coats are already strong enough to resist the stretching which would produce hydrophthalmos, a usual consequence of early and congenital or infantile glaucoma.

Statistics

In the clinical study and the meager statistics available, the most striking association is that of retrolental fibroplasia with premature birth. Of the 100 cases seen periodically, 74 are infants who weighed three and one-half pounds or less at birth. Other observers seem to doubt that prematurity is even an exciting cause of the abnormality.

The ratio of males to females affected has been eight to five. If this ratio is maintained the question of the effect of the presence or absence of male and female hormones would have to be considered as a possible exciting cause along with prematurity. In different centers there is a lack of parallelism in the number of premature infants affected. A careful investigation of the methods for caring for these infants born extremely prematurely would probably clarify this difference.

Etiologies

None of the various classes of etiologies can be absolutely excluded. These include heredity, those causes operating before birth, those arising through premature separation from maternal hormones, the precocious functioning of systems such as the respiratory, digestive and cardiovascular, the heat regulatory center, and those arising through precocious exposure to light. It appears that at least a common exciting factor is related to premature birth and incubator life. It seems logical that, of the etiologies limited to the eyes alone, precocious exposure to light still is the leading factor in the cause of ocular developmental abnormalities, yet no clinical or experimental finding strongly supports this. Heredity seems least likely. To know whether we are studying one disease entity or several which have similar clinical features but different causes would more clearly define our problem.

The value of treatment from the ophthalmologist is relatively meager. We have no cure. We do have medical and surgical treatments aimed more at prevention or eradication of complications than at cure.

Help of Social Worker and Teacher

The greatest value, however, is to be derived from social service workers and preschool teachers. The social service worker first helps the parents to overcome their emotional sense of guilt and frustration, and then provides suggestions and resources available to make a good citizen of the blind child. The preschool teacher for the blind aids the parents in teaching their child to chew solid food, to dress himself and then to appreciate the nature of the world about him.

This ocular abnormality is still one of the great challenges in relation to prematurity. The prognosis at best is questionable, but until it is proved to be hopeless, we have no right to abandon all efforts of treatment.

Continuous Research Needed

Research is being carried on to determine any possible relationship of vitamins, hormones and abnormal intraocular fluid characteristics with the disease.

Early animal experimentation showed that it was possible to raise premature pigs by caesarean section. The experiments were disappointing in that the characteristic ocular lesion did not develop. Further experimentation using monkeys or apes has been considered. Since an estimated 430 infants will be affected yearly by this abnormality it is imperative that research be carried on by the ophthalmologist, the pediatrician, and the obstetrician.

I should like to reiterate that the greatest impact of the problem at the present time is on the social service worker, nursery school teacher, societies for the prevention of blindness, those skilled in all phases of education of preschool blind children and, perhaps just as important, those skilled in the education of parents and relatives as to the proper handling of these infants.

Note and Comment

Confusion in Names and Programs.—The National Society for the Prevention of Blindness has had a number of inquiries from medical and other professional representatives as well as from the lay public on the identity of a newly formed organization, the National Council to Combat Blindness. In order to clarify for readers of the REVIEW the possible confusion arising from the similarity of the name with the National Society's, we are publishing a letter sent to the press by the Society's president, Mason H. Bigelow:

"On January 21, a number of newspapers reported a campaign by a newly formed organization, the National Council to Combat Blindness, to raise funds for research into diseases causing blindness. It is unfortunate that the public should be confused by the similarity of this name to that of the National Society for the Prevention of Blindness, which has been carrying on its work for 40 years.

"The aims of the National Society for the Prevention of Blindness, as originally stated in its charter, are (1) to endeavor to ascertain through study and investigation any causes, whether direct or indirect, which may result in blindness or impaired vision; (2) to advocate measures which shall lead to the elimination of such causes; (3) to disseminate knowledge concerning all matters pertaining to care and use of the eyes.

"In its efforts to prevent blindness from such eye conditions as glaucoma, to assure attention to the problems of the partially seeing, and to promote eye health in industry, schools, and generally throughout life, the National Society for the Prevention of Blindness makes practical application of scientific knowledge relating to the prevention of blindness and conservation of vision. As an example, during the past 40 years an 80 per cent reduction in blindness from ophthalmia neonatorum, commonly known as 'babies' sore eyes,' has been effected. The Society has also made contributions to scientific research in such problems as trachoma, syphilitic optic atrophy, and the relation between German measles in expectant mothers and congenital cataracts. It conducts social and statistical studies of the causes of blindness. Since it is generally accepted that two-thirds of all blindness is preventable, a major

part of the Society's program is devoted to general education of the public in preventive measures.

"The newly formed agency seems to be particularly interested in fostering experimental use of the Filatov treatment for retinitis pigmentosa and has indicated its intention to finance research later in other fields. The National Society for the Prevention of Blindness believes that anything that can be done to further research is to be encouraged provided such undertaking has the approval of appropriate scientific groups like the National Research Council and the Association for Research in Ophthalmology."

Eye-Bank Reports on its Work.—Extensive ophthalmic research which will contribute greatly toward the prevention of blindness is under way in the laboratory of The Eye-Bank for Sight Restoration, Inc., at its national headquarters in New York City, according to a report recently received. Although one of the principal objectives of the research carried on at the present time is the discovery of a method for the preservation of corneal tissue over a longer period of time than 72 hours, a variety of other problems in the field of ophthalmology are also being studied, according to Dr. Herbert M. Katzin, who is in charge of the laboratory.

During the past year, the Eye-Bank has granted seven fellowships for research and sixteen scholarships for its training course in the operation for the transplanting of healthy corneal tissue to blind persons who lost their sight because of corneal defects. Dr. Katzin has been developing special teaching methods to give surgeons the knowledge and skill required for this delicate operation.

Typical of the research projects carried on in the Eye-Bank's laboratory are studies to improve the surgical technique of corneal grafting and to perfect photographic methods for recording purposes; development of newly discovered properties of beta radiation in treatment of corneal scars; study of the use of physiological fibrin as a substitute for sutures, and development of methods for transplantation of the vitreous.

A.P.H.A. Meeting.—The American Public Health Association will hold its 75th Annual Meeting in Atlantic City, New Jersey, October 6–10 inclusive, 1947. Exhibits and the scientific program will point up progress in public health over a 75-year span.

College Health Conference Held in New York City.—Thirty-five leading organizations in health and education sponsored the Third National Conference on Health in Colleges held in New York City, May 7 to 10, 1947. The first meeting of its kind in more than ten years, the Conference was called to meet new health problems arising during the postwar period. National organizations sponsoring the meeting included the Association of American Colleges, the American Association of Teachers Colleges, the American Student Health Association, the American Association for Health, Physical Education and Recreation, and the National Health Council. The National Society for the Prevention of Blindness participated in the work of the Committee on Handicapped Students, Dr. Franklin M. Foote, executive director, discussing the subject of "Responsibilities of College Authorities for the Eye Health and Efficiency of their Students."

International Association for Prevention of Blindness.—Announcement was received of the scientific session of the International Association, held at the Amphitheatre of the Valentin Haüy Association, Paris, France, May 21. "Statistics on the Frequency of Cases of Blindness Due to Cicatricial Opacification of the Cornea" was discussed by Dr. P. Bailliart. Other papers on various aspects of corneal grafting were presented by Dr. R. Castroviejo, Dr. Tudor Thomas, Dr. Guy Offret, Dr. Paufique, Dr. G. P. Sourdille, and Professor Franceschetti.

Pauline Williamson Retires from Metropolitan Life Insurance Company.—Announcement has been received of the retirement from active service of Miss Pauline Brooks Williamson, Chief of the School Health Bureau of the Metropolitan Life Insurance Company. Miss Williamson will continue her interest in the activities of the Bureau, as a member of its advisory educational group, but will devote much of her time to the development of the American Association for Gifted Children, of which she is secretary. The National Society is fortunate in having Miss Williamson's active interest in its program through her membership on its Board of Directors and Executive Committee. Miss Williamson's place as chief of the School Health Bureau will be filled by Miss Marjorie L. Craig, who has been associated with Miss Williamson in the Bureau.

Russell Sage Foundation Appoints New Director.—The appointment of Dr. Donald Young as the new general director of the Russell Sage Foundation to succeed Shelby M. Harrison, retiring as of June 30, 1947, has been announced. Dr. Young has been associated for some years with the Social Science Research Council, serving as executive director for some fourteen years.

The Russell Sage Foundation has recently completed 40 years of service in improving social and living conditions in the United States. Among its social services was its early support of the Committee which later became the National Society for the Prevention of Blindness. This Society has enjoyed for many years the closest cooperation with the Foundation, and looks forward to a continuance of cooperation during Dr. Young's directorship.

Vocational Rehabilitation Courses.—Pennsylvania State College and Colorado A & M College this summer will offer special courses in civilian vocational rehabilitation, credits from which may be applied towards masters' degrees, Michael J. Shortley, director of the Office of Vocational Rehabilitation, Federal Security Agency, was informed today by officials of the two schools. Penn State will offer the course for the first time in its history, Colorado A & M for the first time since World War II. Courses at both colleges will be conducted primarily for personnel of state agencies which provide vocational rehabilitation services to civilian disabled, but other persons interested in the subject are invited to enroll, according to information received.

Physicians Urged to Watch Mental Factors in Ocular Disease.—David O. Harrington, M.D., of the University of California Medical School, San Francisco, believes that "the precision of diagnostic and therapeutic procedure" available to eye physicians today has "led to a conspicuous neglect of psychic (mental) factors in ocular disease."

Writing in the March 8 issue of *The Journal of the American Medical Association*, Dr. Harrington says that "the concept of psychosomatic medicine has been enormously advanced by the experience of the second world war. . . .

"Sometimes an ophthalmologist or perhaps a thoracic surgeon attached as a Naval medical officer to a Marine regiment would live

in such close contact with his troops that, unless he were of the most rigid mental make-up, he could not help but see them as fellow human beings rather than as a group of potential casualties. A short time spent on a board of censors, for example, is an illuminating medical experience. The flight surgeon in the confined atmosphere of a carrier or at a small advanced flight training school soon learned that he must know his fliers before he could successfully treat their illnesses."

Dr. Harrington lists several ocular disturbances of psychogenic origin, including amaurosis fugax, which, he says, is "one of the commonest and most disturbing symptoms confronting the ophthalmologist." The symptoms vary from a fleeting dimness of vision which lasts only a few seconds to complete visual loss for a number of minutes at a time.

"During the war," Dr. Harrington writes, "this symptom (amaurosis fugax) was so frequently encountered in hospitals and dispensaries, both in zones of combat and in areas far removed from them, and was so obviously associated with unpleasant duty, anxiety, frustration and fear that the very term 'black-out' became synonymous with desire for a change of duty. Many of these patients were accused of malingering, and undoubtedly some were guilty of conscious misrepresentation of their troubles, but I feel that in many instances the disturbance was real to the patient, and at times it was genuinely disabling."

Pan-American Congress of Ophthalmology.—Announcement has been received that because of local difficulties, the date of the meeting of the Pan-American Congress of Ophthalmology has been changed to January 4–10, 1948. Arrangements are being made with travel agencies to offer transportation to Havana either by plane, or railroad and boats. To obtain reservations in hotels, members are advised to write as soon as possible to Dr. Tomas Yanes, P. O. Box 970, Havana, Cuba.

The agenda of the Third Congress will be: (1) Presentation of official and of free scientific papers. (2) Sessions pertaining to research. (3) Scientific and commercial exhibits. (4) Courses of instruction. (5) Moving picture exhibits.

Official papers, that is, papers read in representation of an insti-

tution, should take not more than 20 minutes, including time for screen projections, and they should be accompanied by a summary of not more than 600 words.

Dr. Thomas D. Allen, 122 South Michigan Avenue, Chicago 3, is in charge of the courses of instruction; and Dr. Gilberto Cepero, Calle L No. 353, Vedado, Habana, Cuba, of the moving picture exhibits.

Official papers should be mailed on or before August 23, 1947.

I.E.S. Medal Awarded.—Matthew Luckiesh, D.Sc., D.E., Director of the Lighting Research Laboratory, General Electric Co., has been awarded the I.E.S. Gold Medal, given annually by the Illuminating Engineering Society "for meritorious achievement which has conspicuously furthered the profession, art or knowledge of illuminating engineering." The I.E.S. Gold Medal, highest honor in the field of lighting, will be presented to Dr. Luckiesh, together with an official citation, at the Illuminating Engineering Society National Technical Conference to be held September 15–19 in New Orleans.

Dr. Luckiesh is a Fellow of I.E.S., and a past-president of the Society (1925–1926). He is a Fellow also of the American Institute of Electrical Engineers, and an active member of the American Association for the Advancement of Science, American Physical Society, Franklin Institute, Optical Society of America, American Academy of Optometry, National Society for the Prevention of Blindness, and the U. S. National Committee of the International Commission on Illumination.

British Ministry of Education Considers Visual Standards for Teachers.—According to an interesting note appearing in a recent issue of *The Lancet*, the following recommendations for visual standards for teaching candidates were made:

"Visual acuity, with correcting glasses, should not be less than 6/12 in the better eye.

"At the age of 18 no refractive error should debar a candidate from training, but all cases in which the vision in either eye is less than 6/9 uncorrected must be referred for an ophthalmic surgeon's report and prognosis.

"On reference to an ophthalmic surgeon, information is required

on: the nature and extent of the defect; whether it can be corrected by glasses satisfactorily for the project in view; whether it is progressive; whether the existence of the defect is likely to interfere with the candidate's efficiency as a teacher."

Fireworks Accidents in North Carolina.—*The Health Bulletin*, issued by The North Carolina State Board of Health, presents an analysis of 751 fireworks injuries during the 30-day period from December 10, 1946 to January 10, 1947. Of the 751 patients reported treated by physicians, 37 were classified as eye injuries, including nine cases involving the loss of an eye, six resulting in the loss of vision of one eye, two questionable, two cases with corneal scar of one eye, and four cases of burns of the eye. Such experience points a warning to possible dangers during the forthcoming Independence Day celebration.

Industry Assumes Responsibility for Motor Vehicle Fleet Safety.—In describing a driver training course and vision tests provided by the Standard Oil Company of California, R. E. Donovan, chief safety engineer, indicates that since the inception of the course in 1939, there has been a substantial reduction in the motor vehicle accident rate. The training course consists of a series of five one-hour meetings covering causes of accidents, traffic laws, and safe driving practices.

Mr. Donovan reports: "The vision tests are made with the use of commercially available testing equipment. A Keystone Telebinocular, an Ishihara Color Test, a perimeter, and a rod test are used. These tests give a good over-all picture of a person's eyesight, and prove helpful in many ways. If eyesight limitations are found, the drivers are either advised to see an eye specialist, or are given suggestions on driving 'tricks' which help them compensate for the limitation.

"To date about 3,500 vision tests have been given. About one out of every three persons tested has some sort of limitation. Some are very minor, some serious, but all can be helped by a knowledge of their condition and its relation to safe driving principles. During all this time not one person has been taken off his driving job because of his eyesight limitations. The purpose of the testing is solely to help the drivers. Even one-eyed drivers can do a very fine

job of driving if they learn how to compensate for their sight difficulties."

Local Sight Conservation Conference Held.—Under the auspices of the Erie County Branch of the Pennsylvania Association of the Blind, a conference on Prevention of Blindness and Conservation of Vision was held in Erie, Pennsylvania. Among the speakers were Dr. Franklin M. Foote, the National Society's executive director, who spoke on "Prevention of Blindness in a Public Health Program," and Mrs. Winifred Hathaway, associate director, whose topic was "Sight-Saving Classes—Their Purposes and Aims."

Government Recommends Improved Seeing Conditions for Microfilm Readers.—The Industrial Hygiene Division of the U. S. Public Health Service recently was requested by the National Office of Vital Statistics to get at the root of what was causing eyestrain and headaches among the readers of microfilm records in its office. Upon investigation, it was found that the operators, in addition to making the difficult visual adjustment required in shifting their eyes from the bright screen on which the microfilm was shown to the duller sheets and books, were reading at light values ranging from an insignificant figure to three foot-candles. Recommended illumination for this type of work is between 30 and 50 foot-candles. The *Industrial Hygiene Newsletter* for January, 1947, publishes the recommendations made to overcome visual fatigue and resultant eyestrain. They are as follows:

"1. The correction of operators' refractive errors through eye examinations and prescription of glasses when necessary, since the reading of microfilm records is at best a difficult task.

"2. The allowance of a 10-minute rest period out of every hour for each operator pending the installation of corrective lighting measures, and a shorter rest period thereafter.

"3. The installation of local fluorescent lights to insure an intensity of 30 foot-candles on the tabulation sheets and 50 foot-candles on the coding books.

"4. The adjustment of the refractors in the projection screens to insure even distribution of light on the screen.

"5. The dimming or elimination of the light source in the projection screen when the film strip is moved, since the image blurs at this time and causes additional eyestrain.

"6. The addition of a rheostat or other means of intensifying or decreasing the light coming from the screen to eliminate variations in the intensity of the film image caused by variations in the quality of the photography."

Yale Establishes an Institute of Occupational Medicine.—It has been noted with interest that an Institute of Occupational Medicine and Hygiene has been established at Yale University, New Haven, Connecticut. According to the news item, the institute will train students in industrial medicine; offer special instruction to graduate students of medicine, nursing, public health, and engineering; conduct research; and assist industrial concerns in solving medical and health problems. Students will have the opportunity to work as apprentices in the medical departments of large industries.

Back Issues of the Review.—Once again we must appeal to our readers to relinquish any of the following issues of the REVIEW for which they may have no further use, since the demand for these numbers has exceeded our supply: Fall, 1942; Summer, 1943; and Spring, 1946.

The National Society will be glad to extend future issues beyond the subscription expiration to readers sending in any or all of the above-listed numbers.

Current Articles of Interest

Sight Conservation Service, Tennessee Public Welfare Record, January, 1947, published monthly by The Tennessee Department of Public Welfare, 204 State Office Building, Nashville, Tennessee.

This provides a brief report on the sight conservation work of the Division of Services for the Blind in Tennessee. From July, 1943, through December 31, 1946, 3,397 persons received eye care through this service at the cost of $39,231.84. Eye care varies from an eye examination and refraction by an ophthalmologist to the treatment of most complicated diseases. Among the most frequent conditions met by the Division of Services for the Blind in Tennessee were cataracts and cross-eyes.

Ocular Expressions of Diabetes, Isadore Givner, M.D., *New York Medicine,* March 5, 1947, published twice a month by the Medical Society of the County of New York, 2 East 103rd Street, New York 29, N. Y.

The author summarizes recent progress in the consideration of the ocular symptoms in diabetes. In conclusion he states that "one should not consider that there is no more to add to the picture of diabetes in the eye than was observed 75 years ago but, with the advent of newer instruments and newer interpretations of physiopathology in diabetes, try to harmonize the findings with the more modern concepts of the disease."

Evaluation of the Newer Therapeutic Agents in Ophthalmology, Elmer A. Vorisek, M.D., *American Journal of Ophthalmology,* January, 1947, published monthly by the Ophthalmic Publishing Company, 837 Carew Tower, Cincinnati, Ohio.

This author believes that nature has tremendous ophthalmotherapeutic powers, which are being overlooked because of the tendency of modern medicine to look for newer methods of therapy which could produce complete cures in a shorter period of time. Although it is not always possible for a bacteriological study to be made to determine the efficacy of the drug on the infection present, chemotherapy is instituted. Clinical ophthalmologists must be able

to evaluate the information supplied by the researchers, as systemic and local reactions may be more frequent than one would deduce from their literature.

The author cites several cases in which the sulfonamides, penicillin and the hypertherm are of value, but he stresses the fact that therapeutic success depends upon the doctor's ability to analyze each case to determine the best method for quick relief of the patient, with preservation of vision.

Eye Hygiene, Cora L. Shaw, R.N., and Isobel Janowich, *The American Journal of Nursing*, April, 1947, published monthly by The American Nurses' Association, 1790 Broadway, New York 19, N. Y.

Presents in non-technical language the topics of "screening" for eye difficulties, signs of eye trouble in children, definitions of "eye specialists," correct use of glasses, tinted glasses, contact lenses, the value of eye exercises, eyewashes, eye comfort for hospital patients, and educational material on eye care. Also included are brief lists of articles, books, and films which may be used by nurses in carrying on any program of sight conservation.

Colour Vision in the Consulting Room, Frank R. Neubert, *The British Journal of Ophthalmology*, May, 1947, published monthly by the British Journal of Ophthalmology, Ltd., 24–27 Thayer Street, London, W.1, England.

Describing the difference in findings on color plates and color lanterns in a four-year study of color vision of 43,395 subjects, the author provides the following conclusions:

"1. This paper reports the investigation into the colour vision of 40,380 men, of whom 1,152 (3 per cent.) were safe, and 1,083 (2.5 per cent.) were unsafe.

"2. Tests by colour plates, although more sensitive than tests by a single-lantern, are unreliable and differ with different series of plates.

"3. The use of small apertures serves no useful purpose in the examination of colour vision in the consulting room.

"4. The standard single-light lantern is not sensitive enough for discriminating between the 'normal' and the 'unsafe.'

"5. A triple-light lantern with controlled illumination is the most sensitive and reliable apparatus for demonstrating defects of the colour sense in the consulting room."

Nutritional Amblyopia in American Prisoners of War Liberated from the Japanese, Samuel M. Bloom, Maj. (MC), A.U.S., Earl H. Merz, Maj. (MC), A.U.S., and William Wickham Taylor, Capt. (MC), A.U.S., *American Journal of Ophthalmology*, October, 1946, published monthly by the Ophthalmic Publishing Company, 837 Carew Tower, Cincinnati, Ohio.

The authors provide the following summary:

"The early eye findings in American soldiers while in Japanese prison camps and residual findings in some of these men after liberation have been presented. The following conclusions are drawn:

"1. Malnutrition due to a deficient diet can cause an optic atrophy manifested by defective vision, central or centrocecal scotomas, and pallor of the nerve head.

"2. The deficiency seems to be due to a lack of vitamin B_1, since the diet, in every case, was highly deficient in this vitamin; the symptoms occurred coincidentally with beriberi; and the symptoms were relieved by thiamin when administered in the early stages of the deficiency.

"3. If treatment is not instituted early enough, the condition becomes irreversible, as witnessed by the lack of improvement after administration of intensive vitamin therapy at this Center.

"4. The loss of vision and the size of the central scotomas were not in direct proportion to the amount of optic atrophy seen.

"5. The appearance of the disc varied from minimal to complete atrophy, with the vast majority of eyes showing mild temporal pallor.

"6. The maculas had a normal appearance in 60 per cent of the cases and a mottled appearance with loss of the foveal reflex in the remainder.

"7. The nerve involvements—peripheral neuritis and optic atrophy—were the only residual abnormal findings made at this Center on patients who had suffered severe malnutrition over a period of years."

Personality Patterns of White Adults with Primary Glaucoma, Helen L. Hibbeler, M.S.W., *American Journal of Ophthalmology*, February, 1947, published monthly by the Ophthalmic Publishing Company, 837 Carew Tower, Cincinnati, Ohio.

As a result of a study of 27 glaucoma patients to find out whether patients with primary glaucoma exhibit greater personality dis-

turbance than the normative group, and second, to determine whether demonstrable variations of personality patterns could be shown to exist when patients were classified according to various social and medical data, the author concludes that primary glaucoma patients do exhibit more frequent disturbances of personality. "The trend of personality disturbance for the male patients is in the direction of 'depression' and 'hysteria'; the trend for the female patients is in the direction of 'paranoia' and 'schizophrenia.'" The author feels that "statistical analysis provides adequate basis for further study of these trends, which may furnish knowledge valuable in planning medical and social therapy for patients with primary glaucoma."

The Nurse in an Industrial Vision Program, Richard Feinberg, B.S., D.O.S., *American Journal of Optometry and Archives of American Academy of Optometry*, September, 1946, published monthly by the American Journal of Optometry Publishing Association, 1502 Foshay Tower, 821 Marquette Avenue, Minneapolis 2, Minnesota.

The author points out that the industrial nurse should be concerned with the vision of employees since she and the safety engineer often are the team responsible for industrial safety and welfare, which are dependent on good vision. The article includes the following outline of essential factors in a successful eye program:

"1. Testing employees' visual skills.

"2. Proper analysis of specific job visual demands.

"3. Establishment of correlations between visual skills and job demands. These must be established separately for each organization.

"4. Placement of applicants into jobs for which they are qualified visually as well as physically.

"5. Testing employees already on the job using standards established in item 3 above.

"6. Periodic rechecks of special employee groups:

(a) presbyopes

(b) employees in jobs having special visual demands (e.g., very close work)

(c) those already identified as being visually handicapped.

"7. Prompt referral of employees with pathological eye conditions.

"8. Referral of employees requiring refractions and prescription of corrective-protective glasses.

"9. Provision of safety glasses and goggles as well as professional fitting and subsequent servicing of such devices.

"10. Correct lighting through scientific planning.

"11. Adequate facilities for first aid to the eye.

"12. Periodic check of environmental conditions."

Inheritance of Retinoblastoma, Harold F. Falls, M.D., *The Journal of the American Medical Association*, January 18, 1947, published weekly by the American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois.

The author presents two new pedigrees which lend support to evidence that retinoblastoma is a hereditary form of tumor. In summarizing his observations, he emphasizes the fact that parents who have produced a child with retinoblastoma should be urged to discontinue having children, and children surviving enucleation for retinoblastoma should be sterilized.

Infections and Reflex Disorders of the Eye from Dental Affections, Daniel Kravitz, M.D., *American Journal of Ophthalmology*, September, 1946, published monthly by the Ophthalmic Publishing Company, 837 Carew Tower, Cincinnati, Ohio.

Citing a number of case histories, and providing an extensive bibliography on the subject of ocular disorders from dental affections, the author concludes as follows:

"In my opinion, the eyes are closely related to the teeth and, in a fairly large percentage of cases, are involved by dental infections. This relationship holds true not only for the frankly infected teeth but also for the devitalized teeth. Reflex irritations of the 5th nerve from dental conditions can cause severe facial neuralgias which may be indistinguishable from the true *tic douloureux*. It may also result in a pathologic picture simulating inflammatory conditions, particularly of the cornea.

"Indiscriminate sacrificing of teeth should be avoided, and the opinion of a dental surgeon should be sought. Radical dental surgery, such as the removal of many teeth in too short a time, should be avoided because of the danger of an overwhelming reaction in the eye and the subsequent destruction of sight. The indis-

criminate removal of teeth before an eye operation is not warranted. However, teeth showing definite apical infection should be removed. If there is a history of past infection of the eye from focal infection, the devitalized teeth should also be removed."

Contributors to This Issue

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